

calibration using a small Low energy accelerator

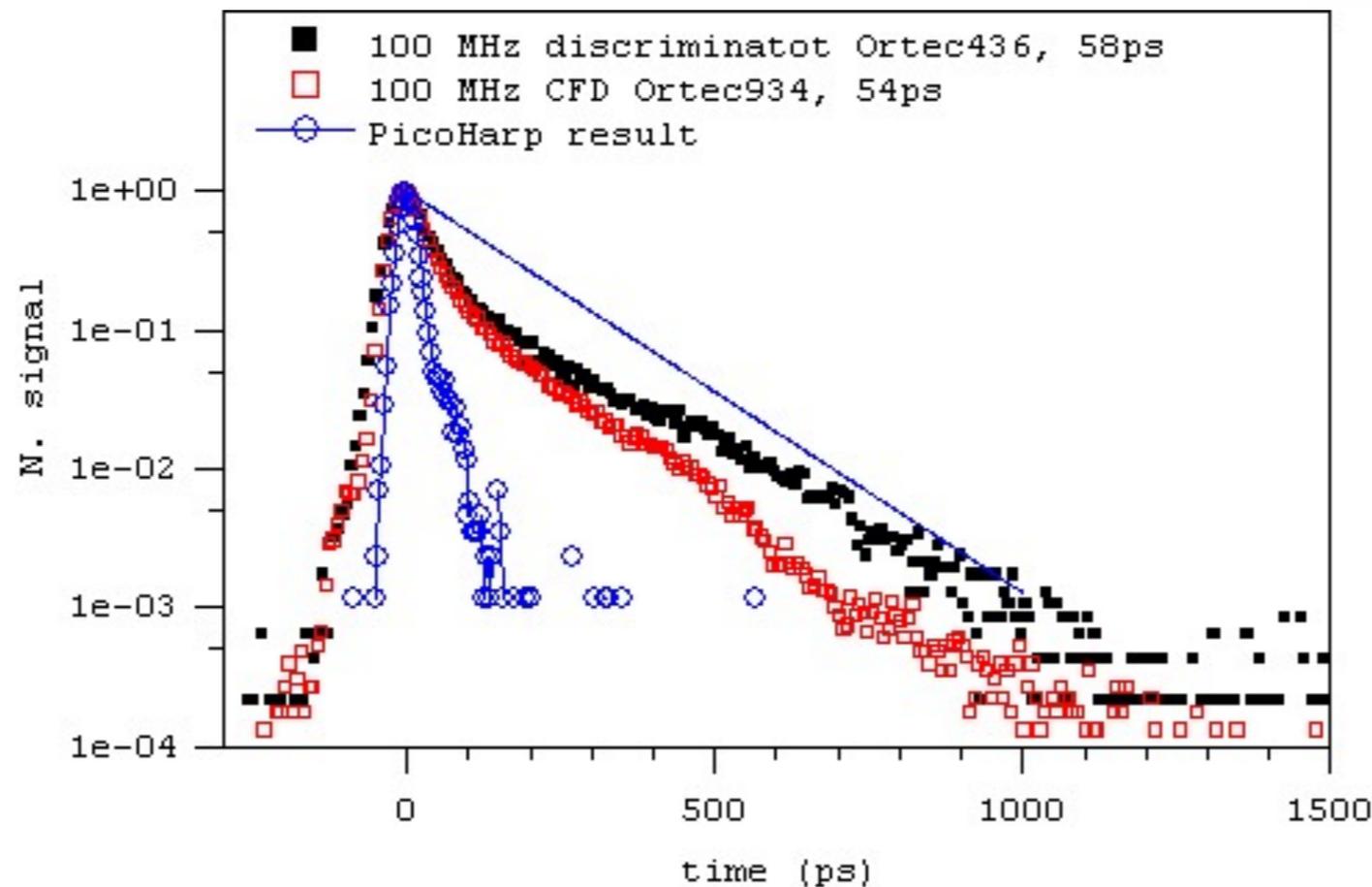
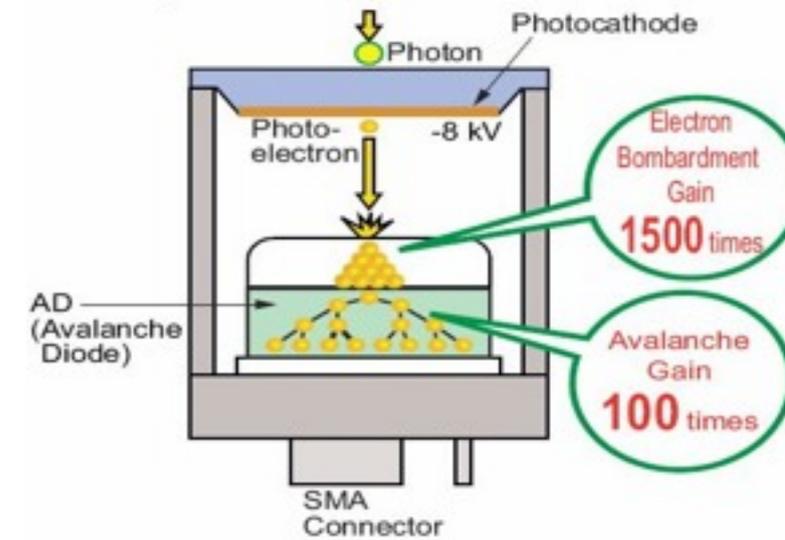
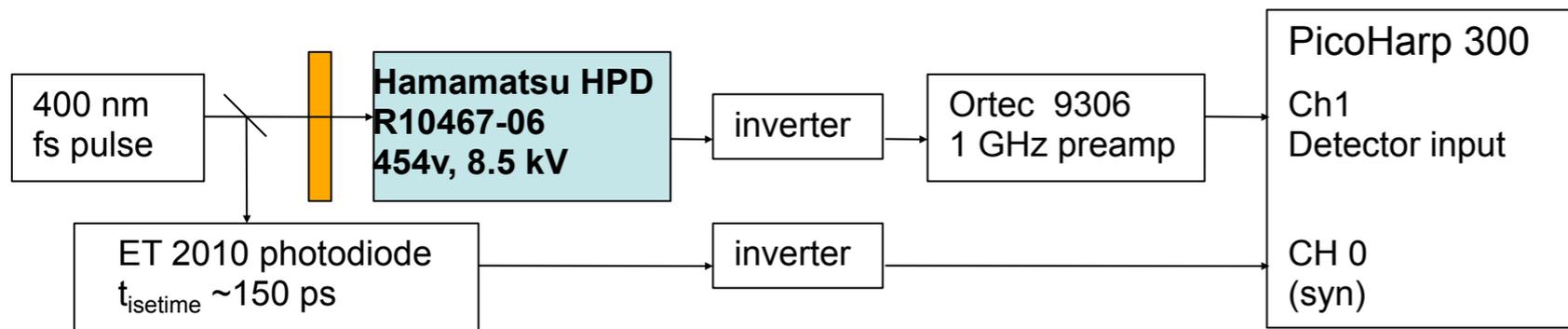
S. White, BNL LBNE meeting
1/8/10

- Michel electrons correspond to the energy of electron machines used in other fields
- these can be ordered through eg. SDL
- or adapted from several machines now being excessed- eg. MIT
- but in this ops. cost is ~\$500k/year
- these machines have interesting parameters- ie 3 psec time structure of ATF
- hard to operate them below $\sim 10^7$ to 10^8 electrons/pulse

We are developing a scattered beam of 1 electron/pulse

This could be useful for LBNE energy calibration

Transit time spread & time jitter, using 100 MHz leading-edge vs CFD vs PicoHarp (good results from laser measurements at BNL. Now preparing e⁻ beam run.)

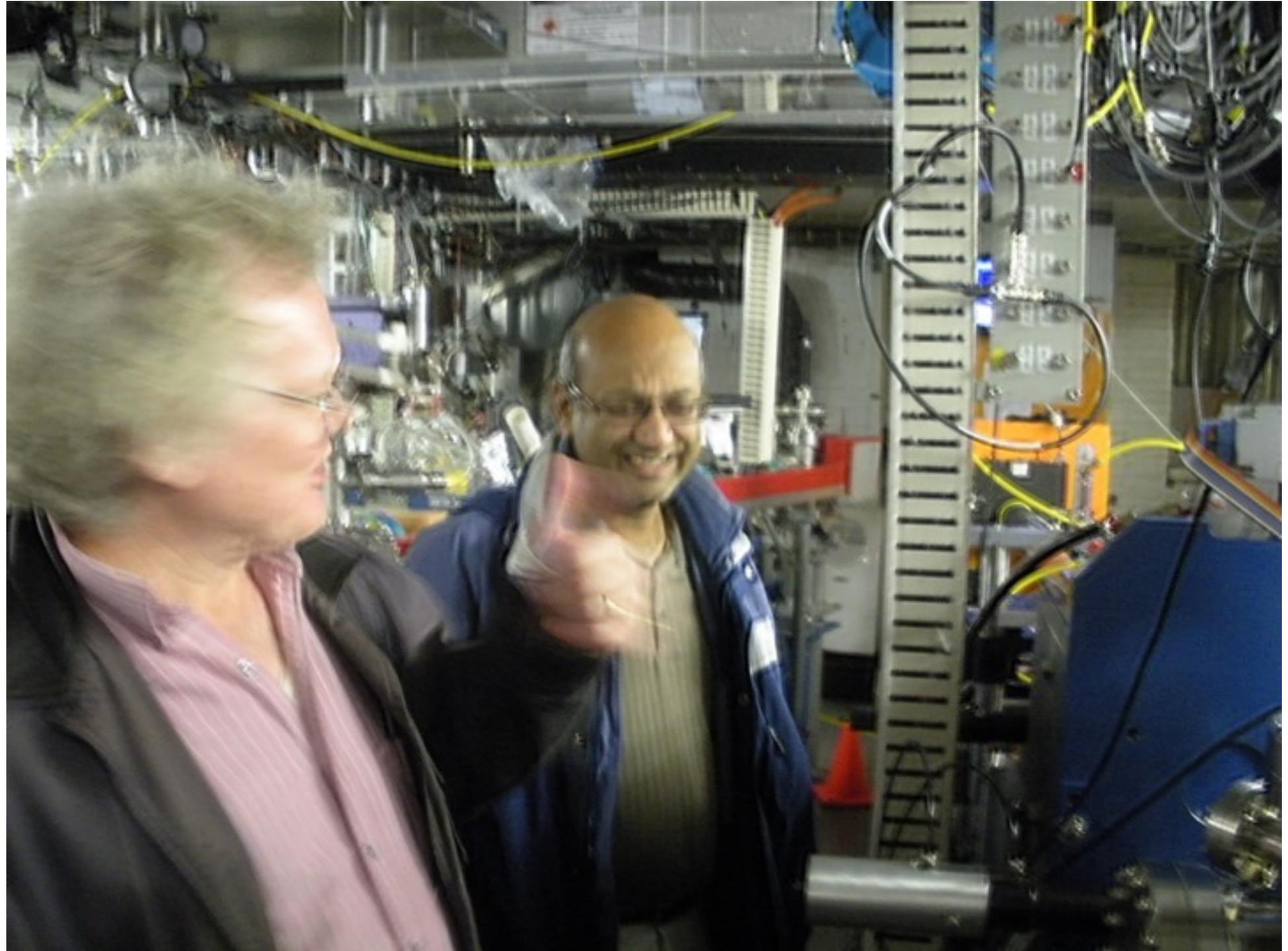


PicoHarp TTS measurement = square root((32 ps)² - (18 ps)²) = ~26.4 ps (FWHM)
A short exponential tail remains.

-> going into beam test rms jitter from electronics & TTS < 10⁻¹¹ sec

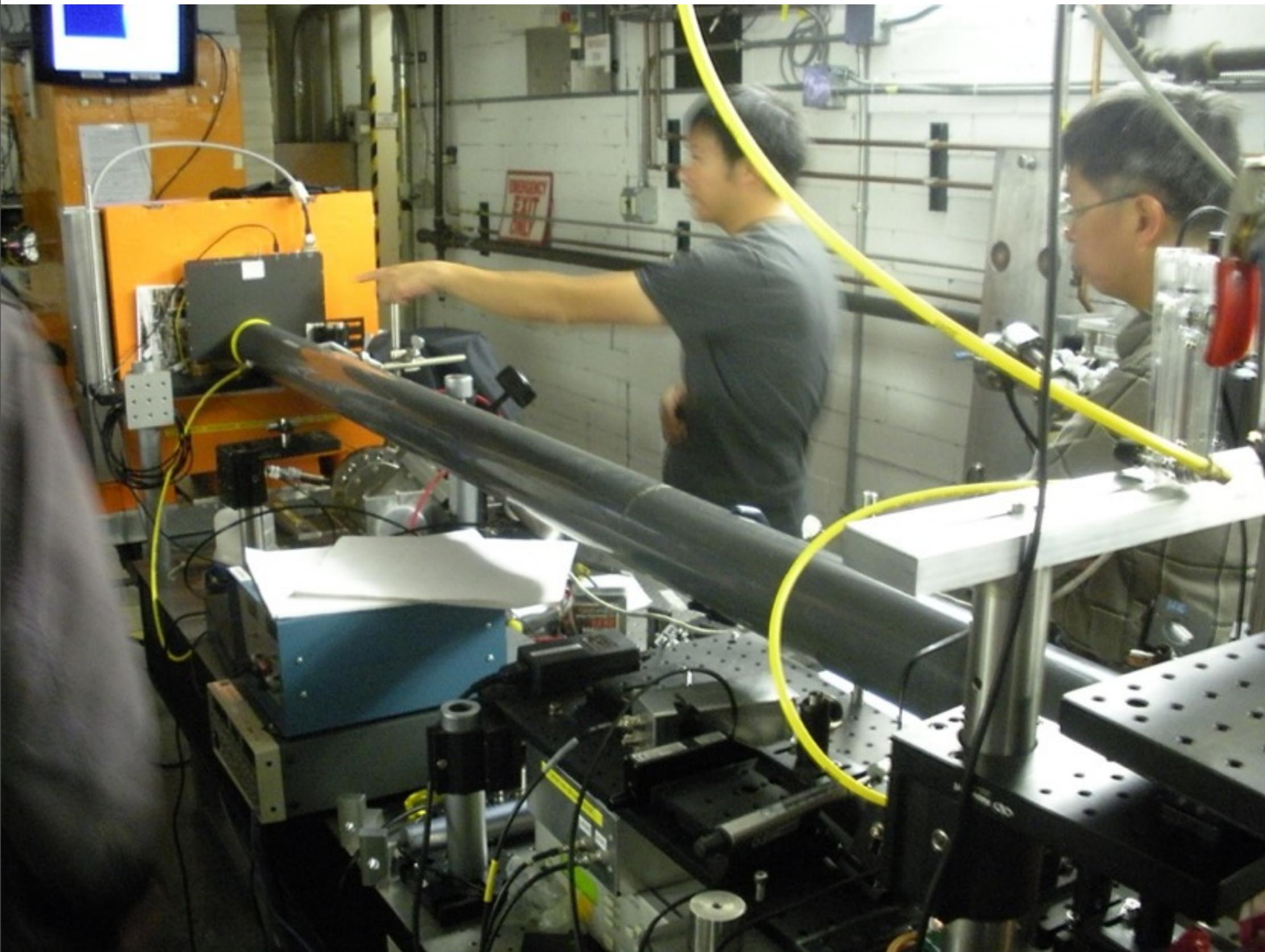
an 80 MeV electron accelerator

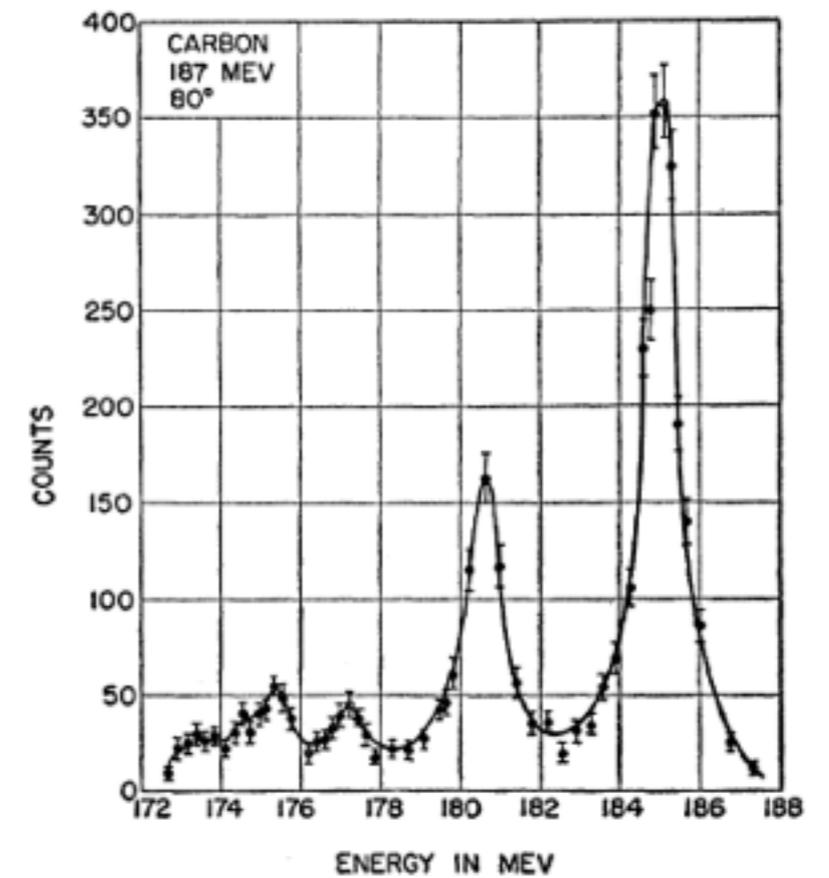
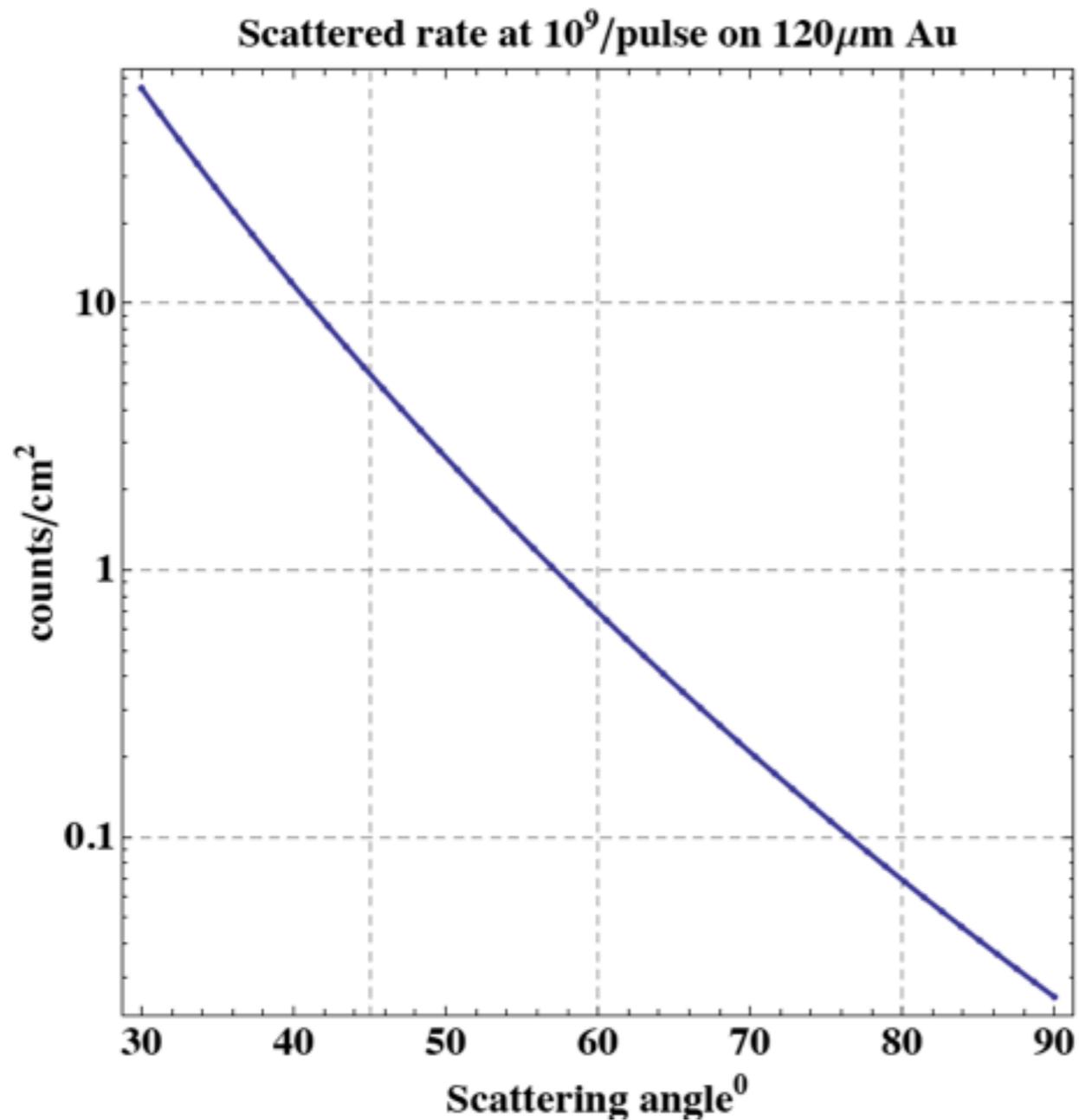
Kirk and Milind
between
beams 1 & 2



T. Tsang, M. Chiu, M. Diwan, S. White, G. Atoian, K. McDonald, K. Goulianos, D. Acker

Applications: RHIC upgrades, electron-Ion Collider, SuperBelle, ATLAS- AFP





If you like inelastic peaks
you can tune them with
angle and Target choice.

Hofstadter data were at ~ 80 Mev so easy to
check these calculations

Background Test

direct e-hole pair measurement
with large active volume APD(blue)
In this case with large controlled
losses.

visual- from “the bee”

